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Ulrich Weidmann

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HUNTSMAN ADVANCED MATERIALS AMERICAS INC.
10003 Woodloch Forest Drive
The Woodlands, TX 77380

EXAMINER

MCCULLEY, MEGAN CASSANDRA

ART UNIT	PAPER NUMBER
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1796

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,908	Applicant(s) WEIDMANN, ULRICH	
	Examiner Megan McCulley	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,8-11 and 13-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,8-11 and 13-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bagga et al. (U.S. Pat. 4,701,378) in view of Blyakhman (U.S. 5,591,811) in further view of Goswami et al. (U.S. Pat. 4,652,398).

Regarding claims 1-5: Bagga et al. teaches a phenol and an imidazole in as epoxy resin as curing accelerators (abstract) at a weight ratio of imidazole to phenol of 1:0.8-4.0 (col. 6 lines 1-10), which converts to a ratio of imidazole to phenol of 44:56-80:20 and overlaps the claimed range. It makes a curable composition (abstract).

Bagga et al. does not teach adding the compound of general formula (I). However, Blyakhman teaches a compound of general formula (I) of the instant application where R₁, R₂, and R₃ are each independently of the other hydrogen; alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 12 carbon atoms, which could be substituted by alkyl groups of 1 to 4 carbon atoms; cycloalkyl-alkyl of 4 to 20 carbon atoms which can be substituted by alkyl groups of 1 to 4 carbon atoms; aryl of 6 to 10 carbon atoms, which could be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; phenylalkyl of 7 to 15 carbon atoms, which could be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; alkenyl of 3 to 12 carbon atoms; alkynyl of 3 to 12 carbon atoms; aromatic or aliphatic acyl group of 3 to 12 carbon atoms or alkyl or aryl of 3 to 12 carbon atoms

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containing a cyano group or a halogen; R4, R5, R6, R7, R8, and R9 are each independently of the other hydrogen; alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 12 carbon atoms, which can be substituted by alkyl groups of 1 to 4 carbon atoms; cycloalkyl-alkyl of 4 to 20 carbon atoms, which can be substituted by alkyl groups of 1 to 4 carbon atoms; aryl of 6 to 10 carbons atoms, which can be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; phenylalkyl of 7 to 15 carbon atoms, which can be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; alkenyl of 3 to 12 carbon atoms; alkynyl of 3 to 12 carbon atoms; halogen; alkoxy of 1 to 12 carbon atoms; or hydroxyl (formula (I) and col. 2 line 59- col. 3 line 16). Bagga et al. and Blyakhman are analogous art since they are both concerned with the same field of endeavor, namely epoxy resin compositions. At the time of the invention a person having ordinary skill in the art would have found it obvious to add in the imidazole of general formula (I) with the composition of Bagga et al. and would have been motivated to do so because 1-imidazolylmethyl-2-naphthols are effective catalysts for curing epoxy resins and provide epoxy resin systems with prolonged room temperature stability and fast curing as stated by Blyakhman (abstract).

Bagga et al. does not teach the specific phenols of the instant application. However, Goswami et al. teaches an epoxy resin, 2,2'-dially bisphenol A (o,o'-diallylbisphenol A) and an imidazole (Example 2). Bagga et al. and Goswami et al. are analogous art since they are both concerned with the same field of endeavor, namely epoxy resin curable compositions. At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the o,o'-diallyl-bisphenol A of

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Goswami et al. with the composition of Bagga et al. and would have been motivated to do so for such desirable properties as an excellent bond strength as discussed in Goswami et al. (col. 7 lines 14-23).

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bagga et al. (U.S. Pat. 4,701,378) in view of Blyakhman (U.S. 5,591,811) in further view of Goswami et al. (U.S. Pat. 4,652,398) and Klein et al. (U.S. 6,245,835).

Regarding claims 8 and 9: Bagga et al. teaches a phenol and an imidazole in as epoxy resin as curing accelerators (abstract) at a weight ratio of imidazole to phenol of 1:0.8-4.0 (col. 6 lines 1-10), which converts to a ratio of imidazole to phenol of 44:56-80:20 and overlaps the claimed range. It makes a curable composition (abstract). Bagga et al. also teaches the epoxy has an epoxide content of at least 0.5 equivalents per kilogram (col. 4 lines 20-25). The accelerator/phenol-imidazole mixture can be used up to 10 parts by weight (col. 6 lines 20-26). Bagga et al. also teaches the curing agent can be an amine (col. 4 lines 25-45).

Bagga et al. does not teach adding the compound of general formula (I). However, Blyakhman teaches a compound of general formula (I) of the instant application where R_1 , R_2 , and R_3 are each independently of the other hydrogen; alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 12 carbon atoms, which could be substituted by alkyl groups of 1 to 4 carbon atoms; cycloalkyl-alkyl of 4 to 20 carbon atoms which can be substituted by alkyl groups of 1 to 4 carbon atoms; aryl of 6 to 10 carbon atoms, which could be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; phenylalkyl of

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7 to 15 carbon atoms, which could be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; alkenyl of 3 to 12 carbon atoms; alkynyl of 3 to 12 carbon atoms; aromatic or aliphatic acyl group of 3 to 12 carbon atoms or alkyl or aryl of 3 to 12 carbon atoms containing a cyano group or a halogen; R4, R5, R6, R7, R8, and R9 are each independently of the other hydrogen; alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 12 carbon atoms, which can be substituted by alkyl groups of 1 to 4 carbon atoms; cycloalkyl-alkyl of 4 to 20 carbon atoms, which can be substituted by alkyl groups of 1 to 4 carbon atoms; aryl of 6 to 10 carbons atoms, which can be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; phenylalkyl of 7 to 15 carbon atoms, which can be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; alkenyl of 3 to 12 carbon atoms; alkynyl of 3 to 12 carbon atoms; halogen; alkoxy of 1 to 12 carbon atoms; or hydroxyl (formula (I) and col. 2 line 59- col. 3 line 16) in the amount of 2-25 parts by weight. Blyakhman also teaches adding a curing agent for the epoxy resin and one or more additives (col. 5 lines 41-53). At the time of the invention a person having ordinary skill in the art would have found it obvious to add in the imidazole of general formula (I) with the composition of Bagga et al. and would have been motivated to do so because 1-imidazolylmethyl-2-naphthols are effective catalysts for curing epoxy resins and provide epoxy resin systems with prolonged room temperature stability and fast curing as stated by Blyakhman (abstract).

Bagga et al. does not teach the specific phenols of the instant application. However, Goswami et al. teaches an epoxy resin, 2,2'-diallyl bisphenol A (o,o'-diallylbisphenol A) and an imidazole (Example 2). At the time of the invention a person

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having ordinary skill in the art would have found it obvious to combine the o,o'-diallyl-bisphenol A of Goswami et al. with the composition of Bagga et al. and would have been motivated to do so for such desirable properties as an excellent bond strength as discussed in Goswami et al. (col. 7 lines 14-23).

Bagga et al. also does not teach the curing agent to have 0.5 to 1.5 functional groups per epoxide group. However, Klein et al. teaches a polyamine curing agent (col. 16 lines 14-49) for an epoxy resin having 0.5 to 2 functional equivalents per epoxy group (col. 11 lines 38-46). Bagga et al. and Klein et al. are analogous art because they are both concerned with the same field of endeavor, namely cured epoxy resins with an imidazole catalyst. At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the functional group ratio of Klein et al. with the composition of Bagga et al. and would have been motivated to do so because with this ratio of functional groups the composition will not have much excess unreacted epoxy resin or curing agent, which would lead to decreased viscosity.

Regarding claim 10: Klein et al. further teaches a polyoxypropylenediamine curing agent (col. 16 line 38). At the time of the invention a person having ordinary skill in the art would have found it obvious to use a polyoxypropylenediamine as a polyamine curing agent and would have been motivated to do so because polyoxypropylenediamine is more reactive curing agent for epoxy resins.

Regarding claim 11: Bagga et al. teaches using glycidyl esters (col. 3 lines 10-15).

Claim 15 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Bagga et al. (U.S. Pat. 4,701,378) in view of Blyakhman (U.S. 5,591,811) in further view of Goswami et al. (U.S. Pat. 4,652,398) and Klein et al. (U.S. 6,245,835) as applied to claim 8 above and in further view of Das et al. (U.S. Pat. 5,922,448).

Regarding claim 15: Bagga et al. teaches the basic composition as set forth above. Not disclosed is a prepreg. However, Das et al. teaches a prepreg comprising a similar composition (col. 10 lines 40-60). Bagga et al. and Das et al. are analogous art since they are both concerned with the same field of endeavor, namely epoxy resin compositions. At the time of the invention a person having ordinary skill in the art would have found it obvious to make a prepreg out of the composition of Bagga et al. and would have been motivated to do so to use in electrical laminates.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bagga et al. (U.S. Pat. 4,701,378) in view of Blyakhman (U.S. 5,591,811) in further view of Goswami et al. (U.S. Pat. 4,652,398).

Regarding claim 13: Bagga et al. teaches adding an epoxy resin (abstract), curing agent (abstract), at a weight ratio of imidazole to phenol of 1:0.8-4.0 (col. 6 lines 1-10), which converts to a ratio of imidazole to phenol of 44:56-80:20 and overlaps the claimed range. It makes a curable composition (abstract).

Bagga et al. does not teach adding the compound of general formula (I). However, Blyakhman teaches adding the compound of formula (I) to an epoxy resin (col. 4 lines 54-58), a curing agent (col. 5 lines 41-48) and a phenol (col. 5 lines 41-48).

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At the time of the invention a person having ordinary skill in the art would have found it obvious to add in the imidazole of general formula (I) with the composition of Bagga et al. and would have been motivated to do so because 1-imidazolylmethyl-2-naphthols are effective catalysts for curing epoxy resins and provide epoxy resin systems with prolonged room temperature stability and fast curing as stated by Blyakhman (abstract).

Bagga et al. does not teach the specific phenols of the instant application.

However, Goswami et al. teaches an epoxy resin, 2,2'-diallyl bisphenol A (o,o'-diallylbisphenol A) and an imidazole (Example 2). At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the o,o'-diallylbisphenol A of Goswami et al. with the composition of Bagga et al. and would have been motivated to do so for such desirable properties as an excellent bond strength as discussed in Goswami et al. (col. 7 lines 14-23).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bagga et al. (U.S. Pat. 4,701,378) in view of Blyakhman (U.S. 5,591,811) in further view of Goswami et al. (U.S. Pat. 4,652,398) as applied to claim 13 above and in further view of Das et al. (U.S. Pat. 5,922,448).

Regarding claim 14: Bagga et al. teaches the basic method as set forth above. Not disclosed is dissolving the imidazole and phenol in the curing agent. However, Das et al. further teaches dissolving components before curing at a temperature of 65-75 °C (col. 9 lines 39-52). At the time of the invention a person having ordinary skill in the art

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would have found it obvious to dissolve the components first and would have been motivated to do so to insure a homogenous solution.

Response to Arguments

Applicant's arguments with respect to claims 1-5, 8-11, and 13-15 have been considered but are moot in view of the new ground(s) of rejection. However, the arguments still pertaining to the above rejection are discussed below.

Applicant's argument that unexpected results are shown table 2 on page 8 of the specification is not persuasive. The experiment is not commensurate in scope with the claims since only one ratio of imidazole is shown. Also, comparison is not made to the closest prior art (see MPEP 716.02 (d) and (e)). The closest prior art, Bagga et al. contains a phenolic component, so comparison to a composition having only an imidazole does not compare to the closest prior art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Megan McCulley whose telephone number is (571)270-3292. The examiner can normally be reached on Monday - Thursday 7:30-6:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571) 272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/
Supervisory Patent Examiner, Art Unit 1796

/M. M./
Examiner, Art Unit 1796